JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY

SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE/SNE WITH IT

2ND YEAR 1ST SEMESTER 2016/2017 ACADEMIC YEAR

MAIN CAMPUS - REGULAR

COURSE CODE: SBT 202

COURSE TITLE: PLANT MINERAL NUTRITION

EXAM VENUE: LAB 11 **STREAM: (BED SCIENCE/SNE)**

DATE: 21/04/16 **EXAM SESSION: 2.00 – 4.00 PM**

TIME: 2 HOURS

Instructions:

1. **Answer ALL questions in Section A and Any two questions in Section B**
2. **Candidates are advised not to write on question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

SECTION A: ANSWER ALL QUESTIONS (30 MARKS)

1. List three factors that govern nutrient uptake by plants. (3 marks)
2. Using a labeled diagram, describe the relationship between plant growth and amount of available nutrients. (3 marks)
3. Briefly explain how microorganisms can affects physical and chemical components of the soil. (3 marks)
4. Using a diagram, explain three differences between mobile and immobile nutrients
5. List three differences between processed fertilizers and organic fertilizers. (3 marks)
6. Describe your understanding of the following: a) Fertilizer blending b) Analyte c) Essential nutrients. (3 marks)
7. A farmer complained of perennial low yield on his farm. As a consultant, describe three methods you can use to determine nutrient levels to improve the yield. (3 marks)
8. List three disadvantages of commercial fertilizers. (3 marks)
9. List State three factors that affect nutrient release from organic fertilizers. (3 marks)
10. State three factors that affect the choice of soil analytical method. (3 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

11. (a)Discuss in details two methods of passive uptake of mineral ions in plants. (8 marks)
    (b)Discuss biological methods of soil analysis. (12 marks)
12. (a) Discuss four methods of fertilizer application. (12 marks)
    (b) Citing relevant examples, describe four avenues of nutrient losses from the soil (8 marks)
13. You have been approached by a farmer who owns a 25 feet by 20 feet garden to estimate the quantity of fertilizer recommendation that calls for adding 0.5 pound of N per 100 square feet, 1 pound of phosphate per 100 square feet and 1 pound of potash per100 square feet. Explain all the necessary steps you will follow to determine the quantity of fertilizer and finally estimate how much fertilizer the farmer will require (20 marks).
14. (a)Discuss the effects of land use system on plant minerals (12 marks)

    (b) Describe four nutritional adaptation mechanisms found in plants. (8 marks).